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ABSTRACT

The Database Advisor (DBA) is a tool designed to guide users to the most appropriate World Wide Web-based databases for their research. Developed in 1997 by the Science Libraries at the University of California, San Diego (UCSD), DBA is a Web-based front-end to bibliographic and full-text databases to which UCSD has remote access. DBA allows the user to specify terms, then automatically performs a keyword search of all profiled databases. When teachers, students, or library staff begin a research project, it is not always obvious which database would be the best resource to locate information on a topic. As K-12 schools rely more and more on databases via the Internet, a search tool such as DBA will be essential. This paper provides a description of how DBA works, the equipment and resources necessary to implement it, where to get the source code, and why K-12 schools should consider the product. (MES)

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# *Database Advisor* : a New Tool for K-12 Research Projects

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**Abstract:** The Database Advisor (DBA) is a tool designed to guide users to the most appropriate Web-based databases for their research. When teachers, students or library staff begin a research project it is not always obvious which database would be the best resource to locate information on a topic. As K-12 schools rely more and more on databases via the Internet, a search tool such as Database Advisor will be essential. Presented herein, is a description of how the Database Advisor works, the equipment and resources necessary to implement, where to get the source code, and why K-12 schools should seriously consider this product. To see the Database Advisor in action, visit UCSD's public version for the Sciences at: http://scilib.ucsd.edu/Proj/dba/dba_public.html.

## What is *Database Advisor*

Database Advisor software was developed in 1997 by the Science Libraries at the University of California, San Diego (UCSD). Database Advisor (DBA) is a web-based front-end to bibliographic and full text databases to which UCSD has remote access via the Web, Z39.50 and telnet. Database Advisor allows the user to specify terms, then automatically performs a keyword search of all profiled databases. DBA spawns a search process for each database, quickly sorts and returns the results from each database. The user can see which database contains the most information on the topic. A hyperlink to each database is included so the user can immediately get to the results or the specific database to launch a search in that interface.

## Why K-12 schools need *Database Advisor*

When students and staff in public schools are engaged in research projects, time and cost are very big factors. Databases are often purchased by consortiums, special licensing arrangements, or through specialized grants such as EDL (Electronic Doorway Library) grants. The vast numbers of possible places to find information often confuse patrons in public schools. The Database Advisor (DBA) can assist K-12 students and staff by suggesting starting points in specific databases that match the information need of the user.

Database Advisor is a tool that will simultaneously search all profiled databases, and it can increase usage of some expensive and underutilized databases. Customization of the various databases would also advise the user if there is an extra fee or provide an alternate avenue to obtain the data. Database Advisor has the ability to reduce the amount of time spent researching a topic using databases. Use of this tool will focus the user's attention on the specific databases that are likely to provide useful information. As K-12 schools rely more and more on databases via the Internet, a search tool such as Database Advisor will be essential.

K-12 school libraries are increasing using web pages as starting points for research. If Database Advisor was an add-on feature to some of the instructional web pages, patrons would immediately know which databases they could gain access to free of charge. Although many people believe that the Internet is free, this is not true. This is especially true for valid, authentic sites, including databases. Someone has to pay for the development, data entry, programming and site maintenance. In order to gain access to high quality, valid reference sites, schools have to make difficult decisions on which databases they can offer. This decision is often fiscally driven. K-12 schools simply can not afford the same databases as large academic institutions. They often have to pool resources together to be able to purchase even a single database.

Time is always an issue. K-12 students often are locked into specific times that usually range from thirty to ninety minute class periods. Schools continue to follow an agrarian calendar and school day. When Database Advisor is added to a web site, this time barrier is broken. Students can access and do a great deal

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of research from home or the public library. They can also maximize their in-school research time by e-mailing information they find to their own e-mail address for later reference work.

Database Advisor has already been created and the source code is free of charge to K-12 schools. DBA is designed to be "portable" for application in any organizational environment, including schools. Schools need to pay a person to adapt the source code to meet their specific needs. This tailors the features of Database Advisor to their unique instructional needs. As K-12 libraries increasingly use web based content subscription services they need tools to assist their patrons. Database Advisor can maximize their time and improve their results.

## How *Database Advisor* works

DBA works somewhat like a DIALOGWEB's DIALINDEX® search – on a much smaller scale, and with results customized to your unique local database mix. Database Advisor's appearance (input boxes, point-and-click, radio boxes, etc.) will be familiar to Web users. Graphic load is kept to a minimum, with a familiar, easy-to-use Web interface. For example, in the Web environment hitting the "enter" key sends a search query; DBA observes this convention. On the Welcome Screen it is obvious where the user enters search terms (Fig. 1).

This service will help you decide which of the UCSD Libraries' 25+ science databases to use to locate the articles and other materials you need. For assistance with non-science databases, try Database Advisor for the Social Sciences and Humanities. Please note that many of these databases have license restrictions.

**Enter the terms you would like to search for:**

(10/28/1999)

computer ergonomics Submit!

*for example: hiv protease inhibitor*

How many minutes are you willing to wait? 1 min

*Search Help*

By default, Database Advisor searches only databases with current articles. You can include databases with older articles as well ("backfiles") - include backfiles?

Current only  Include backfiles

**Figure 1.** Welcome Screen -- enter search terms

The user is given options to change default settings. Searching current files is the default, but the user can choose to include backfiles. Most users want to quickly search ALL databases but the user can select subject categories thereby limiting the databases searched (Fig. 2). Most search results are listed within one minute, but if more time is needed the user can increase the search time – this is a useful feature when databases timeout before returning results. The Help section provides guidance in structuring DBA searches (Fig. 3).

SUBJECT CATEGORIES (optional) ▲ Return to Top

- To limit your search by subject category, click in the box next to that category. You can select more than one.
- If you select nothing from the sections below, all subject categories will be assumed.
- There are 10 broad subject categories included in Database Advisor, each of which includes a number of different databases.
- A list of the databases included in each subject category is available.

☐ All Subject Categories

☐ Biology
☐ Chemistry
☐ Computer Science
☐ Engineering
☐ Mathematics
☐ Medicine
☐ Oceanography
☐ Physics
☐ Science Business
☐ Science Education

**Figure 2:** User selects subject category(s)

SEARCH HELP ▲ Return to Top

**Database Advisor** (DBA) will take the terms you specify and automatically perform a **keyword search** in over 25 different databases. Your results indicate the number of **hits** that would be found in each one, ranked from the most to least hits. You can then link directly to the database of your choice to perform your search. Here are some tips to help you use **Database Advisor** most effectively:

| Tip | DO | DON'T |
|---|---|---|
| Keep it simple<br>• limit to one or two main concepts<br>• don't use multiple synonyms, use only one word for each concept | bridge corrosion | bridge corrosion rust acid rain precipitation |
| Boolean searches<br>• Do not use AND, OR, or NOT<br>• AND is implied between each word | aspirin headache | (aspirin OR ASA) AND (headache OR migraine) |

The following **are not available** in Database Advisor, but may be available in one or more individual databases when searched directly:

- **author searching**
- **phrase searching / word adjacency**
- **single letters and special characters** - e.g., π, Σ, e
- **wild card characters / truncation symbols** - e.g., * ? #
- **case sensitivity** - e.g., MIT vs mit

**Figure 3.** Search Help

When the user hits the "enter" key, Database Advisor automatically performs a keyword search of more than 25 science databases. DBA spawns a search process for each of our nine database vendors and returns the hits on the query (Fig. 4). Results are ranked, so the user can see where each database stands relative to the others. Each database has a link that can be followed to access the database and continue the search process. The concept of "instant gratification" has been implemented; the user goes directly to the results of a search when they choose a database. This function presents some technical challenges and is not available for all UCSD databases. A legend (Fig. 5) explains the Results page.

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DATABASE advisor RESULTS

**Book Databases:** numbers represent hits

16 Circuit SDSU:Library catalogs of UCSD, SDSU, USD, and CSU-San Marcos
11 MELVYL Catalog:Library catalog for all UC campuses
9 ROGER:UCSD Library catalog - books, whole journals, etc
1 UCSD Bookstore:UCSD Campus Bookstore

You searched for: **computer ergonomics**

Want to refine your search? *Help reading this page*

Feedback is appreciated! Technical details about DRA's search strategies are available

| # Hits | Database Name & Description |
|---|---|
| 818 | INSPEC A▤ I◘ Profile<br>Literature of physics, electrical engineering, electronics, computers, control theory |
| 696 | COMP: Computer Articles A▤ T▤ Profile<br>Selected consumer and business oriented computer magazines, good for computer product reviews |
| 594 | ABI/Inform A▤ T▤ Profile<br>Citations and some full-text articles in business and management journals |
| 544 | PsycINFO A▤ Profile<br>Covers journal articles and reports in psychology, psychiatry and related disciplines |
| 371 | MAGS: Magazine & Journal Articles A▤ T▤ Profile<br>Citations to general-interest articles, many with abstracts, some with full text |

**Figure 4:** Top of the Results screen

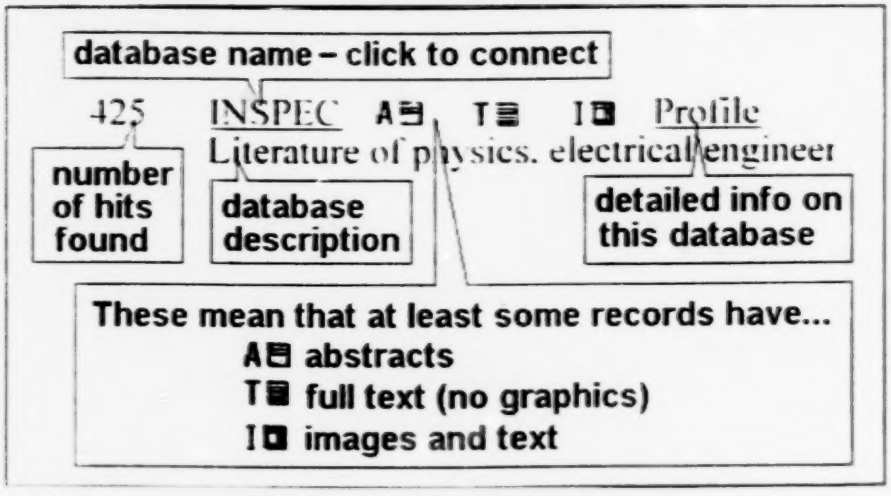
database name – click to connect
425
INSPEC A▤ T▤ I◘ Profile
Literature of physics. electrical engineer
number of hits found
database description
detailed info on this database
These mean that at least some records have...
A▤ abstracts
T▤ full text (no graphics)
I◘ images and text

**Figure 5.** The "Legend" explains the Results screen

At this point the user can examine the database profiles (Fig. 6), refine all aspects of a search (Fig. 7), or click on a database name on the Results screen (Fig. 4) to run a search in that database.

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## COMP: Computer Articles Profile

| | |
|---|---|
| **Database Name** | COMP: Computer Articles |
| **Search URL** | http://www.melvyl.ucop.edu/?CSdb=comp |
| **Starting date** | 1988 |
| **Ending date** | present |
| **Abstracts** | Y |
| **Full text** | Y |
| **Full image** | N |
| **Subjects** | Computer Science, Science Business |
| **Update frequency** | weekly |
| **One line description** | Selected consumer and business oriented computer magazines; good for computer product reviews |
| **One paragraph description** | Use the MELVYL Computer Articles database (COMP) to retrieve records for articles in about 200 consumer and business oriented computer magazines. The articles are indexed by Information Access Company and include subjects and abstracts, plus the complete text for many articles. This is a particularly good place to obtain product reviews for computer components and peripherals. |

**Figure 6.** Sample database profile

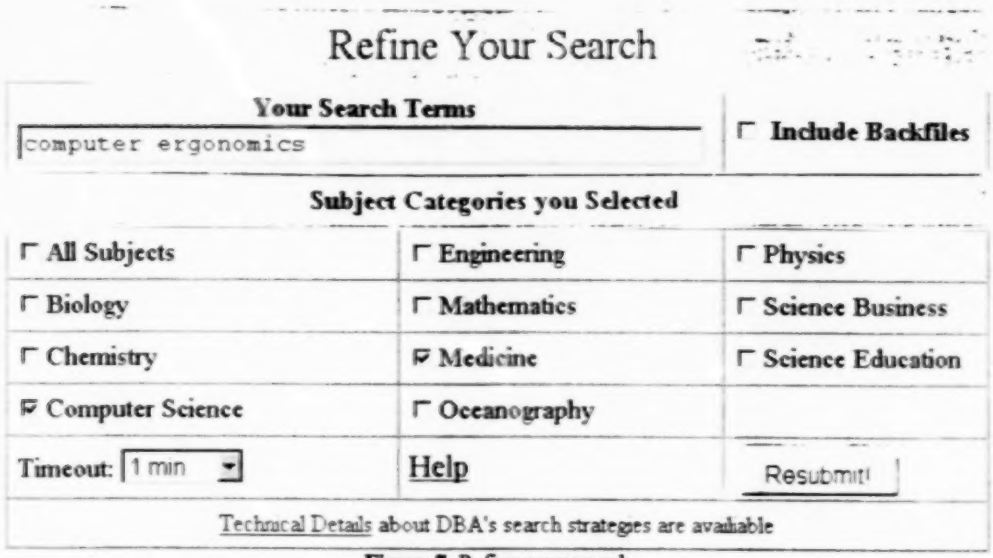


**Figure 7.** Refine your search

A Database Advisor search differs from searching in a specific database. Searches are limited to the databases profiled by the librarians and databases in the user-specified subject categories. While users supply the keywords, the librarians have already supplied the search strategies to standardize the search across the various databases. Precise technical search strategies and fields are used to search each database. "Our goal in designing search strategies was to achieve an equivalent search of title words, abstract words, and subject terms in each database. This was not always possible because of the differences in the fields available and the way in which each database searches these fields. To achieve uniformity across databases, DBA's search strategies are by necessity rather generic" (Hightower, et al., 1997). Database Advisor guides users in choosing a database, it does not perform the most precise search possible in each database. Using the unique features and search capabilities of a database, more precise searches can be performed and users can refine their search as appropriate for each database used.

DBA searches three types of **bibliographic** databases: web, Z39.50 and telnet. Precise technical search strategies and fields searched in each database in Database Advisor are available at: http://scilib.ucsd.edu/Proj/dba/search_strat.html. Database Advisor does not search Yahoo or the rest of the Web. DBA was designed to search bibliographic indexes and abstracts, like Inspec and Compendex, because we lacked a good tool that searched across databases supplied from so many different vendors. Several meta-search engines (like *Inference Find* and *Metacrawler*) exist that traverse the publicly accessible webspace. Perhaps in the future it will be possible to offer a link to one or more of these meta-search engines from DBA…as long as the results remained useful rather than overwhelming or confusing to the user.

## Implementation…how to get source code

To implement at your site someone (a technically-savvy librarian or administrator, for example) will need to work with an on-site programmer to select databases, assign appropriate subject categories, develop profiles and determine the search strategies that will work. A single programmer currently on staff in the UCSD library now maintains the code, adding and adjusting database scripts and profiles as necessary.

A fully functional version of DBA is available to users of UCSD Internet accounts (i.e., those using a UCSD Academic Computing account, or those in an on-campus building). Obviously, non-UCSD usage of databases has licensing implications. A public version is available so you can see a "live demonstration" of how Database Advisor works. Note: Some databases are removed from the public version of DBA due to license restrictions. Anyone with Web access, regardless of UCSD affiliation, can use the demo version of Database Advisor. However, many of the databases that show up on the Results page are restricted to University of California (UC) or UCSD users, and may not allow access from outside IP addresses. To see the Database Advisor in action, visit the Public Version of DBA Sciences at: http://scilib.ucsd.edu/Proj/dba/dba_public.html

The source code for Database Advisor, Sciences version, is available under the terms of the GNU General Public License at: http://scilib.ucsd.edu/Proj/dba/code/dba-source.html . The DBA program is free software. You can redistribute it and/or modify it under the terms of the GNU General Public License as published by the Free Software Foundation (either version 2 of the License, or any later version). The program source code is distributed in the hope that it will be useful, but without any warranty. For more details about the GNU General Public License see: http://www.gnu.ai.mit.edu/copyleft/gpl.html. To run DBA at your site you need a UNIX computer with Internet connectivity and the equivalent of an Apache Web server (common in academic settings). You need the following software to install Database Advisor:

**Z 39.50 API Client software for Z39.50 connections**: You obtain the code from http://lindy.stanford.edu/~harold/z3950/www_gateway.html

**GNU C compiler:** To compile the zclient code for your machine. For more information on the GNU project and a list of FTP sites for GNU software go to http://www.delorie.com/gnu/

**perl (version 5.004_01 or later)**: You can get the latest version of perl from: http://www.perl.com

## Summary

Database Advisor has the ability to reduce the amount of time spent researching a topic using databases. Use of this tool will focus the user's attention on the specific databases that are likely to provide useful information. As K-12 schools rely more and more on databases via the Internet, a search tool such as Database Advisor will be essential. Many K-12 school systems now have both the technology and programming ability to implement a tool like DBA, and, at this time, Database Advisor is the only tool we have seen that meets this information need.

## References

Hightower, Christy, Jennifer Reiswig, and Susan S. Berteaux. (June 1998). "Introducing Database
*College & Research Libraries News*, 59(6):409-412.